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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/924,546	08/09/2001	Toshiaki Takase	Q65791	1990

7590 07/15/2005

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EXAMINER

JUSKA, CHERYL ANN

ART UNIT	PAPER NUMBER
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1771

DATE MAILED: 07/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/924,546

Applicant(s)

TAKASE ET AL.

Examiner

Cheryl Juska

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-9,12-15,17-22,24-33 and 35-44 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1,5-9,12-15,17-22,24-33 and 35-44 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed April 20, 2005, has been entered. Independent claims 1, 17, and 28 have been amended as requested. Claims 2-4, 10, 11, 16, 23, and 34 are cancelled, while new claims 39-44 have been added. Thus, the pending claims are 1, 5-9, 12-15, 17-22, 24-33, and 35-44.

2. Applicant's amendment is sufficient to overcome the 103 rejection based upon Tanaka (EP 834 938) in that said amendment incorporates the subject matter of claims 11, 23, and 34 into the claims. Said subject matter (i.e., that fibers forming the nonwoven fabric are fixed substantially only by fusing the fibers to each other) was not previously rejected over Tanaka since the Tanaka invention explicitly requires hydroentangling in conjunction with heat-fusing to bond the nonwoven fabric to provide improved breaking strength. Therefore, modifying the Tanaka invention to have the fibers fixed substantially only by fusing would destroy the intended invention.

3. Applicant's amendment is also sufficient to overcome the prior art rejections based upon Aikawa (US 6,468,651). Specifically, applicant has amended the claims to recite a fiber length not taught by the reference. Hence, the 102 rejection is hereby withdrawn. Additionally, the claims are not rejected under 103 since applicant has made a statement of co-assignment with said Aikawa reference according to 103(c). Therefore, the 103 rejections set forth in sections 5 and 6 of the last Office Action are also withdrawn. However, the following new art rejection is set forth below.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 5-9, 12-14, 17-22, 24-26, 28-33, 35-37, and 39-44 are rejected under 35 USC 103(a) as obvious over JP 2000-160432 issued to Aikawa.

Aikawa discloses superfine fibers and a nonwoven made therefrom (English abstract).

The superfine fibers are high melting point polypropylene fibers having a diameter of less than or equal to 5 microns and are made from island in the sea composite filaments (abstract). When the fiber is made into a nonwoven fabric by a wet-laid method, the fiber length may be about 0.5-30 mm (English translation, section [0019]). The propylene composite fibers may contain a third component such as a low melting point fiber, such as polyethylene or a polypropylene copolymer (section [0013] - [0015]). Said nonwoven may incorporate other fibers such as polyethylene, polypropylene, or polymethylpentene fibers (section [0026]). [Note applicant's high modulus fibers comprise polyethylene and copolymers thereof, polypropylene and copolymers thereof, and polymethylpentene.] Additionally, said other fibers may be a composite fiber of two or more polymers such as a bicomponent fiber having adhesive properties (section [0026]). Said nonwoven is suited for use as a filter media particularly as a separator for battery cells (section [0029]). The exemplary nonwovens are uniform without fiber lumps (section [0032] and [0034]).

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Thus, Aikawa teaches the limitations of claims 1, 5, 6, 17-19, 28-30, 39-44 with the exception of the claimed thickness, apparent total surface area of the fibers, uniformity index, and Young's modulus. With respect to the claimed thickness, it is argued that the thickness would have been readily obvious to one of ordinary skill in the art. Specifically, it would have been obvious to one skilled in the art to employ a nonwoven thickness in the amount recited by applicant, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. The thickness of the nonwoven can readily be determined based upon the intended use of a battery separator and limited by the fineness of the fibers employed in said nonwoven.

Regarding the claimed apparent total surface area of the fibers, uniformity index, and Young's modulus, these recited properties are not explicitly taught by the cited Aikawa reference. However, it is reasonable to presume that said properties would be present in the Aikawa invention when modified by the desired nonwoven thickness. Support for said presumption is found in the use of like materials and like processes for making the nonwoven fabric. Products of identical composition cannot have mutually exclusive properties. *In re Spada*, 15 USPQ2d 1655. In the alternative, it would have been readily obvious to one skilled in the art to manipulate the fiber composition and crystallinity to improve the Young's modulus and to manipulate the fiber length and cross-sectional shape and size and the nonwoven density to improve the total surface area of the fibers and the uniformity index. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

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In re Boesch, 205 USPQ 215. Therefore, claims 1, 5, 6, 17-19, 28-30, 39-44 are rejected as being obvious over the cited prior art.

6. Regarding claims 7-9, 12-14, 20-22, 24-26, 31-33, and 35-37, it is argued that these claims are also obvious over the cited prior art. Specifically, the ratio of fiber types, fiber diameters, and fiber lengths are deemed obvious to one skilled in the art since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 205 USPQ 215. The ratio of fiber type determines the balance of properties obtained from each fiber type, while the fiber diameters and lengths can also attribute the overall nonwoven properties, such as tensile strength, uniformity, pore size, void rate, etc. Thus, optimization of these features are within the level of ordinary skill in the art. Therefore, claims 7-9, 12-14, 20-22, 24-26, 31-33, and 35-37 are rejected as obvious over the prior art.

7. Claims 15, 27, and 38 are rejected under 35 USC 103(a) as being obvious over the cited Aikawa reference in view of EP 834 938 issued to Tanaka.

Aikawa fails to explicitly teach a hydrophilic treatment. However, such a treatment for battery separators is well known in the art. For example, Tanaka teaches treating the nonwoven for hydrophilic properties by a sulfonating treatment, a fluorine gas treatment, a vinyl graft polymerization treatment, surfactant treatment, or discharging treatment, (page 6, lines 28-32). Therefore, it would have been readily obvious to one skilled in the art to employ a hydrophilic treatment such as is known in the art to facilitate the use of said nonwoven as a battery separator. Therefore, claims 15, 27, and 38 are also rejected.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

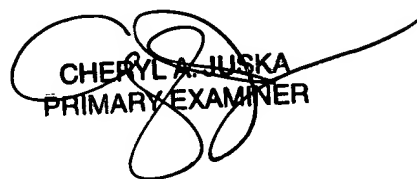
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cheryl Juska whose telephone number is 571-272-1477. The examiner can normally be reached on Monday-Friday 10am-6pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached at 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


CHERYL A. JUSKA
PRIMARY EXAMINER

cj
July 11, 2005